MicroLogix 1100

SELECTION GUIDE

**PROGRAMMABLE
CONTROLLER**

1763

**Rockwell
Automation**

MicroLogix Family Overview

The MicroLogix family of programmable controllers provides four levels of control. Small on size, big on performance, the MicroLogix 1000 offers control capabilities in an affordable, compact package. The MicroLogix 1200 is small enough to fit in tight spaces, but powerful enough to accommodate a broad range of applications. Designed to grow as your needs grow, the MicroLogix 1500 helps you achieve high-level control in a variety of applications. The MicroLogix family's newest member, the MicroLogix 1100, further enhances the MicroLogix family by expanding the application coverage area while offering great new features at an affordable price.

MicroLogix 1100

Description

The MicroLogix 1100 is our newest family of controllers to join the popular MicroLogix 1000, MicroLogix 1200, and MicroLogix 1500 controllers, and is designed to broaden application coverage through embedded analog inputs, Ethernet communications and visualization capabilities. MicroLogix 1100 controllers maintain the same critical features you have come to expect from the MicroLogix family, and expand that capability to include true online editing. MicroLogix 1100 controllers complement our low-end controllers for applications that require up to 80 digital I/O.

Each MicroLogix 1100 contains two embedded analog inputs, with 10 digital inputs and 6 digital outputs. The controller may also expand its I/O capabilities using the same modules as the MicroLogix 1200. Up to four of the 1762 I/O modules can be used with a single MicroLogix 1100 controller.

Utilizing the latest version of our world class RSLogix 500 programming software, the MicroLogix 1100 controller may be programmed with an instruction set that is common with the MicroLogix 1000, MicroLogix 1200, MicroLogix 1500 and SLC 500 families of controllers. RSLogix 500 Starter, Standard, and Professional all support the MicroLogix 1100, including its online editing capabilities.

Each controller supports a built-in RS-232 / RS-485 combo port for serial and networked communication and a second built-in EtherNet/IP port, which supports Ethernet peer-to-peer messaging.

An embedded LCD screen allows you to monitor controller and I/O status, as well as make changes to bit and integer data.

A field-upgradable flash operating system protects your investment and ensures you will always be up-to-date with the latest enhancements. The controller can be easily updated with the latest firmware via a Web site download.

Advantages for the MicroLogix 1100 Controllers

• Large 8K memory (4K User Program with 4K User Data) to solve a variety of applications

• True online editing allows tuning of program, including PID, without going off-line.

• Support for MicroLogix 1100 online editing in RSLogix 500 Professional, Standard, and Starter version 7.0 and above.

• Mode switch for Run/Remote/Program

• Time based or event triggered data logging capability stores controller data records with optional time stamp in a separate 128K byte memory area for later analysis (trending, I/O status during alarm condition, etc.)

• Recipe storage (up to 64K bytes that is deducted from Data Logging memory), that is accessible by your ladder program, enabling quick and easy batch changes of program data for timers, counters, etc.

• High performance expansion I/O options (up to four 1762 I/O modules, in any combination)

• Four high-speed inputs (1763-L16BWA and 1763-L16BBB only) that can be used individually as latching (pulse-catch) inputs, event interrupts, or alternately combined as one 20 kHz high-speed counter featuring eight modules of operation

• Two built-in 0-10V dc analog inputs with 10 bit resolution (not isolated)

• Two high-speed outputs that can be configured as 20 kHz PTO (Pulse Train Output) or as PWM (Pulse Width Modulated) outputs (1763-L16BBB only)

• Multiple input commons allow you to use the controller for either sinking or sourcing input devices and multiple output commons provide individual isolation in multi-voltage output applications

• One, 1 ms, selectable timed interrupt (STI)

• High-resolution, 1 ms timers

• Communication Channel 0 provides isolated RS-232 or RS-485 electrical compatibility (selectable through the choice of communication cables)

- Through RS-232, we support DF1 Full Duplex / DF1 Half Duplex Master and Slave / DF1 Radio Modem / ASCII. Additionally, DH-485, Modbus™ RTU Master and Slave are also supported through the 1761-NET-AIC module– see "Through RS-485" below

- Through RS-485, we support direct interface to DH-485 and Modbus RTU Master / Slave networks (without an external electrical interface converter)

- Communication Channel 1 consists of an embedded RJ45 port that supports EtherNet/IP for peer-to-peer messaging. This 10/100 Mbps port supports BOOTP and DHCP

- Communications toggle push button that allows the controller's Channel 0 port to toggle between user configured communications parameters and factory default settings for an easy means to switch from Modbus RTU or ASCII protocols (which do not support programming) to DF1 Full duplex (to upload / download, monitor, or edit your program), so a programming computer is able to connect to a controller with an unknown or incorrect communication parameter settings for troubleshooting.

- Embedded real-time clock

- Optional memory module for external program backup, for program transport, and transfer to another controller. Program and data in the controller is also battery backed for secure storage.

- Data file download protection prevents critical user data from being altered via program downloads from programming computers or memory modules

- Built-in LCD provides access to 48 bits and 48 integers that may be changed, or optionally protected, for monitor only access by an operator

- New LCD instruction allows the controller to output messages to the LCD, and optionally receive user input

- IP address can be monitored directly through the built-in LCD

- Two built-in digital trim potentiometers

- 32-bit signed integer math

- Floating-point and double integer data file support

- Built-in PID capabilities

- Finger-safe terminal blocks meet global safety standards

- Regulatory agency certifications for world-wide market (CE, C-Tick, UL, c-UL, including Class 1 Division 2 Hazardous Location)

Other MicroLogix Family Controllers Overview

MicroLogix 1000

Description

Based on the architecture of the market-leading SLC 500 controller family, the MicroLogix 1000 brings high speed, powerful instructions and flexible communications to applications that demand compact, cost-effective solutions.

The MicroLogix 1000 programmable controller is available in 10-point, 16-point or 32-point digital I/O versions. Analog versions are also available with 20 digital I/O points, with 4 analog inputs (two voltage and two current) and 1 analog output (configurable for either voltage or current).

The analog I/O circuitry for the MicroLogix 1000 units is embedded into the base controller, not accomplished through add-on modules. So, it provides very cost-effective analog performance.

The MicroLogix 1000 controller utilizes RSLogix 500 programming software and shares a common instruction set with the MicroLogix 1100, MicroLogix 1200, MicroLogix 1500 and SLC 500 families of controllers.

Advantages for the MicroLogix 1000 Controllers

• Preconfigured 1K program and data memory to ease configuration (bit, integer, timers, counters, etc.)

• Fast processing allows for typical throughput time of 1.5 ms for a 500-instruction program

• Built-in EEPROM memory retains all of your ladder logic and data if the controller loses power, eliminating the need for battery back-up or separate memory module

• Multiple input commons allow you to use the controller for either sinking or sourcing input devices and multiple output commons provide isolation in multi-voltage output applications

• RS-232 communication channel allows for simple connectivity to a personal computer for program upload, download and monitoring using multiple protocols, including DF1 Full Duplex

• RTU slave protocol support using DF1 Half-Duplex Slave allows up to 254 nodes to communicate with a single master using radio modems, leased-line modems or satellite uplinks

• Peer-to-peer messaging capability allows you to network up to 32 controllers on a DH-485 network (using a 1761-NET-AIC module)

• Advanced communications networks, including DeviceNet and EtherNet/IP through the 1761-NET-DNI and 1761-NET-ENI communication modules

• Controllers that have 24V dc inputs include a built-in high-speed counter (6.6 kHz)

• Adjustable DC input filters allow you to customize the input response time and noise rejection to meet your application needs

• Regulatory agency certifications for world-wide market (CE, C-Tick, UL, c-UL, including Class 1 Division 2 Hazardous Location)

MicroLogix 1200

Description

The MicroLogix 1200 controllers provide more computing power and greater I/O flexibility than the MicroLogix 1000 to solve a variety of application needs.

Available in 24 and 40-point versions, the I/O count can be expanded using rackless I/O modules. This results in larger control systems, greater application flexibility and expandability at a lower cost and reduced parts inventory.

A field-upgradable flash operating system ensures you will always be up-to-date with the latest features, without having to replace hardware. The controller can be easily updated with the latest firmware via a web site download.

Building on the features of the MicroLogix 1000, the MicroLogix 1200 also has additional advantages.

Advantages for the MicroLogix 1200 Controllers

• Large 6K memory (4k User Program with 2K User Data) to solve a variety of applications

• High performance expansion I/O options (up to 6 modules depending on current / power budget)

• Four high-speed inputs (for controllers with 24V dc inputs) that can be used individually as latching (pulse-catch) inputs, event interrupts, or alternately combined as one 20 kHz high-speed counter featuring eight modes of operation

• One high-speed output that can be configured as 20 kHz PTO (Pulse Train Output) or as PWM (Pulse Width Modulated) output (available on controllers with embedded 24V dc outputs)

• One, 1 ms, selectable timed interrupt (STI)

• High-resolution, 1 ms timers

• The same advanced communications options as the MicroLogix 1000, including peer-to-peer and SCADA/RTU networks, DF1 Full Duplex, DF1 Half Duplex Slave, DH-485, DeviceNet and EtherNet/IP , plus DF1 Half Duplex Master, Modbus Master and Slave, and DF1 Radio Modem protocols

• ASCII read / writes

• An additional Programming / HMI Port, providing connectivity to a DF1 Full Duplex compatible device such as an operator interface or programming terminal (MicroLogix 1200R only, 1762-LxxxxxR controllers)

• Communications toggle push button that allows the controller's Channel 0 port to toggle between user configured communications parameters and factory default settings for an easy means to switch from Modbus RTU or ASCII protocols (which do not support programming) to DF1 Full duplex (to upload / download, monitor, or edit your program), so a programming computer is able to connect to a controller with an unknown or incorrect communication parameter settings for troubleshooting.

• Optional real-time clock, to allow control to be based on actual time of day, day of week, or other calendar related timing.

• Optional memory module, for external program backup, transport and transfer to another controller. Control program and data are securely backed up to internal flash memory when power is not applied.

• Data file download protection prevents critical user data from being altered via program downloads from programming computers or memory modules

• Two built-in analog trim potentiometers

• 32-bit signed integer math

• Floating-point and double integer data file support

• Built-in PID capabilities

• Finger-safe terminal blocks meet global safety standards

• Removable terminal blocks on 40-point controllers allow pre-wiring

• Regulatory agency certifications for world-wide market (CE, C-Tick, UL, c-UL, including Class 1 Division 2 Hazardous Location)

MicroLogix 1500

Description

The MicroLogix 1500 is a world-class programmable logic control platform with even more advanced features and performance than the MicroLogix 1200. Many of these features allow this controller to be used in applications where much larger controllers were required in the past.

MicroLogix 1500 architecture features an innovative two-piece design with a small footprint. The processor and base units slide together to form the complete controller. The processor and base are independently replaceable, allowing you to maximize your embedded I/O, memory, and communication options while minimizing inventory stocking costs.

Bulletin 1769 Compact I/O modules expand the controller's embedded I/O offerings and provide the additional flexibility to cover a wide range of applications. This high-performance modular and rackless I/O platform provides front accessibility for removal and insertion. Removable terminal blocks further lower the total system cost by reducing start-up and maintenance time.

New features are provided with an enhanced user interface that uses function files to consolidate programming parameters. This simplifies the user interface and increases controller performance.

The MicroLogix 1500 includes all the features of the MicroLogix 1200, plus more.

Advantages for the MicroLogix 1500 Controllers (in addition to MicroLogix 1200 features)

• Large memory to solve a variety of applications.
  1764-LSP: 7K user program capacity (3.65K User Program with 4K User Data)
  1764-LRP: 14K user program capacity (10K User Program with 4K User Data)

• Mode switch for Run / Remote / Program

• MicroLogix 1500 controllers using the 1764-LRP processor, can perform time based or event triggered data logging. This allows the controller to store data records with optional time stamp in a separate 48K byte memory area for later analysis (trending, I/O status during alarm condition, etc.)

• Recipe storage (up to 48K bytes that is deducted from Data Logging memory), that is accessible by your ladder program, enabling quick and easy batch changes of program data for timers, counters, etc.

• High performance expansion I/O options (up to 16 modules using an additional bank of expansion I/O and expansion power supply)

• There is an additional Channel 1 configurable isolated RS-232 communications port on the 1764-LRP processor

• Battery for non-volatile user program and user data (built-in and optional replacement)

• Optional data access tool (1764-DAT) allows a user to change integer and bit values within the controller, or optionally protect these elements for monitor only.

• Eight high-speed inputs (for controllers with 24V dc inputs) that can be used individually as latching (pulse-catch) inputs, event interrupts, or alternately combined in groups of four (0 through 3, and 4 through 7) as two 20 kHz high-speed counter featuring eight modes of operation

• Two high-speed output that can be configured as 20 kHz PTO (Pulse Train Output) or as PWM (Pulse Width Modulated) output (available on controllers with embedded 24V dc outputs)

• Removable terminal blocks on all MicroLogix 1500 Base Units and I/O modules enable pre-wiring

MicroLogix System Selection Checklist

Use the following Checklist as a guide to completing your own system specification. Skip any sections that do not apply.

✓	Step	See
	1 Select Controller Family: MicroLogix 1000, 1100, 1200 or 1500 • controller family - based on memory, I/O, required control functionality, and dimensions • consider future expansion requirements • consider requirement for online editing • consider the need for networked communications • if selecting the MicroLogix 1000, 1200 or 1500, see 1761-SG001 (MicroLogix Programmable Controllers Family Selection Guide)	page 13
	2 Select MicroLogix Communication Interface Devices • communication network - based on application requirements • record your selection in the Selection Record (starts on page 39)	page 19
	3 Select Programming Software • software - the appropriate RSLogix 500 package for your application • record your selection in the Selection Record (starts on page 39)	page 25
	4 Select Cables • cables - review device port identification to find cable in the selection chart • record your selection in the Selection Record (starts on page 39)	page 26
	5 Select MicroLogix 1100 Controllers and Accessories • controller - review power and I/O configurations to select a controller catalog number; see power supply and I/O specifications for more detailed information • accessories - memory module • record your selection in the Selection Record (starts on page 39)	page 29
	6 Select MicroLogix 1100 Expansion I/O • I/O modules - digital, analog and temperature • record your selection in the Selection Record (starts on page 39)	page 33
	7 Fill in Your Selection Listing • all catalog numbers required for your system specification	page 39

Select Controller Family: MicroLogix 1000, 1100, 1200 or 1500

Step 1 - Select:

- *controller family - based on memory, I/O, added functionality, programming instructions and dimensions*
- *consider future expansion requirements*
- *consider requirement for online editing*
- *consider the need for networked communications*
- *if selecting the MicroLogix 1000, MicroLogix 1200 or MicroLogix 1500, see 1761-SG001 (MicroLogix Programmable Controllers Selection Guide), for more information.*

Review the Features, Programming Instructions, Controller Specifications and Controller Dimensions to determine which level of MicroLogix controller is required.

Features

MicroLogix 1000, 1100, 1200 and 1500 Feature Comparison Chart

Controller	MicroLogix 1000	MicroLogix 1100	MicroLogix 1200 / 1200R	MicroLogix 1500 1764-LSP / 1764-LRP
Bulletin Number	**1761**	**1763**	**1762**	**1764**
Memory (in user words) User Program / User Data				
Up to 1K	1K combined (preconfigured)			
Up to 6K			4K / 2K	
Up to 7K				3.6K / 4K 1764-LSP
Up to 8K		4K / 4K		
Up to 14K				10K / 4K 1764-LRP
Online editing		✔		
Non-volatile program and data	EEPROM	Battery back-up static RAM	Flash	Battery back-up static RAM
Memory Module (for program back-up and transport)	through hand-held programmer	Optional	Optional	Optional
I/O				
Embedded digital I/O (max.)	32	16	40	28
Embedded analog I/O	Two current and two voltage inputs with one current or voltage output on 20 pt. controllers	Two 0 - 10V dc inputs on all controllers		
Local Expansion I/O (max.)	none	64	96	512
Thermocouple / RTD		Expansion	Expansion	Expansion
Networked Expansion I/O	none	none	none	DeviceNet using 1769-SDN scanner can own 63 slave devices (such as a 1769-ADN with up to 30 I/O modules per 1769-ADN)
Added Functionality				
Trim Potentiometers		Two (digital)	2	2
PID		✔	✔	✔
High Speed Counters (embedded)	One @ 6.6 kHz	One @ 20 kHz	One @ 20 kHz	Two @ 20 kHz
High Speed Counters (expansion)				with 1769-HSC Two quadrature or four pulse/count @ 1 MHz
Motion: Pulse Width Modulated or Pulse Train Outputs for use with stepper or servos		Two @ 20 kHz	One @ 20 kHz	Two @ 20 kHz

MicroLogix 1000, 1100, 1200 and 1500 Feature Comparison Chart

Controller	MicroLogix 1000	MicroLogix 1100	MicroLogix 1200 / 1200R	MicroLogix 1500 1764-LSP / 1764-LRP
Bulletin Number	**1761**	**1763**	**1762**	**1764**
Real Time Clock		Embedded	Optional	Optional
Data Access Tool				Optional
LCD: monitor I/O and controller status / data adjustment		Embedded		
Data Logging		Up to 128Kb		Up to 48Kb, 1764-LRP
Recipe (uses data logging memory)		Up to 68Kb		Up to 48Kb, 1764-LRP (1764-LSP can use program memory)
Floating Point Math		✓	✓	✓
ASCII Data File		✓	✓	✓
Programming				
Windows - RSLogix 500 Software	✓	✓	✓	✓
Hand-Held Programmer	✓			
Communications				
Serial Ports	One RS-232 8-pin mini DIN	One isolated RS-232 / RS-485 combo 8-pin mini DIN	(1) 8-pin mini DIN 1200 controllers (1) 8-pin mini DIN & (1) 8-pin mini DIN Programming / HMI only port 1200R controllers	(1) 8-pin mini DIN 1764-LSP processors (1) 8-pin mini DIN & (1) isolated 9-pin D-shell, 1764-LRP processors
Ethernet Ports		One 10/100 Mbps RJ-45		
DeviceNet peer-to-peer messaging / Slave functionality	with 1761-NET-DNI	with 1761-NET-DNI	with 1761-NET-DNI	with 1761-NET-DNI
DeviceNet Scanner, with Master and Peer-to-Peer comms				with 1769-SDN (1764-LRP only)
EtherNet/IP Peer-to-Peer Messaging	with 1761-NET-ENI or 1761-NET-ENIW	Embedded or w/ 1761-NET-ENI or 1761-NET-ENIW	with 1761-NET-ENI or 1761-NET-ENIW	with 1761-NET-ENI or 1761-NET-ENIW
Web Server Capabilities	with 1761-NET-ENIW	Embedded or w/ 1761-NET-ENIW	with 1761-NET-ENIW	with 1761-NET-ENIW
DH-485 Networking	with 1761-NET-AIC	Embedded	with 1761-NET-AIC	with 1761-NET-AIC
SCADA RTU - DF1 Half-Duplex	Slave only	Master / Slave	Master / Slave	Master / Slave
SCADA RTU - DF1 Radio Modem		✓	✓	✓
SCADA RTU - Modbus RTU		Master / Slave	Master / Slave	Master / Slave
ASCII - Read/Write		✓	✓	✓
Operating Power				
120/240V ac	✓	✓	✓	✓
24V dc	✓	✓	✓	✓
Agency Certifications				
CE, C-Tick, UL and C-UL (including Class 1, Division 2 for Hazardous Location)	✓	✓	✓	✓

Programming Instructions

MicroLogix controllers have the range of functionality necessary to address diverse applications. The controllers use the following types of instructions:

• Basic Instructions (i.e., Examine if On, Examine if Off)

• Data Comparison Instructions (i.e., Equal, Greater than or Equal, Less than or Equal)

• Data Manipulation Instructions (i.e., Copy, Move)

• Math Instructions (i.e., Add, Subtract, Multiply)

• Program Flow Control Instructions (i.e., Jump, Subroutine)

• Application Specific Instructions (i.e., Programmable Limit Switch, Sequencer)

• High-Speed Counter Instruction

• High-Speed PTO (Pulse Train Output) and PWM (Pulse Width Modulated) Instructions *(for MicroLogix 1100, 1200 and 1500 only)*

• Communication Instruction *(including ASCII for MicroLogix 1100, 1200, and 1500 only)*

• Recipe Instruction *(MicroLogix 1100 and 1500 only)*

• Data Logging Instruction *(MicroLogix 1100 and 1500 1764-LRP processor only)*

• LCD Instruction *(MicroLogix 1100 only)*

Controller Specifications for MicroLogix 1100 Controllers

Controller General Specifications

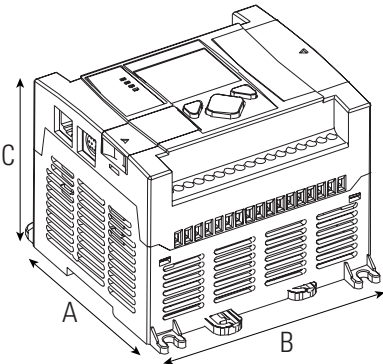| Specification	MicroLogix 1100 (Bulletin 1763)
User Program and Data Memory	8K battery backed RAM: 4K user program, 4K user data
Data Elements	configurable, user defined file structure, 4K max. data size

Environmental Specifications and Certifications

Specification	1763 Controllers
Operating Temperature	-20…65 °C (-4…149 °F)
Storage Temperature	-40…85 °C (-40…185 °F)
Relative Humidity	5…95% non-condensing
Vibration	Operating: 10…500 Hz, 5 g, 0.015 in max. peak-to-peak (Relay Operation: 1.5 g)
Shock, Operating	30 g; 3 pulses each direction, each axis (Relay Operation: 10 g)
Shock, Non-Operating	50 g panel mounted (40 g Din Rail mounted); 3 pulses each direction, each axis
Certifications	UL Listed Industrial Control Equipment for use in class 1, Division 2, Hazardous Locations, Groups A, B, C, D
	C-UL Listed Industrial Control Equipment for use in Canada
	CE marked for all applicable directives
	C-Tick marked for all applicable acts
Electrical/EMC	The controller has passed testing at the following levels
ESD Immunity	EN 61000-4-2 4 kV contact, 8 kV air, 4 kV indirect
Radiated Immunity	ENV 50204 10V/m, 1000 MHz
Radiated RF Immunity	EN 61000-4-3 10V/m, 26…1000 MHz (alternatively, 80…1000 MHz), 80% amplitude modulation, +900 MHz keyed carrier
EFT/B Immunity	EN 61000-4-4 Power Supply, I/O: 2 kV , 5 kHz Communications Cable: 1 kV , 5 kHz
Surge Transient Immunity	EN 61000-4-5 Unshielded Communications Cable: 2 kV CM (common mode), 1 kV DM (differential mode) Shielded Communications Cable: 1 kV galvanic gun I/O: 2 kV CM (common mode), 1 kV DM (differential mode) AC Power Supply: 4 kV CM (common Mode), 2 kV DM (differential mode) DC Power Supply: 500V CM (common mode), 500V DM (differential mode) AC/DC Auxiliary Output: 500V CM (common mode), 500V DM (differential mode)
Conducted RF Immunity	EN 61000-4-6 Power Supply, I/O: 10V, 150 kHz…80 MHz
Conducted Emissions	EN 55011 AC Power Supply Input: 150 kHz…30 MHz
Radiated Emissions	EN 55011 30 MHz…1000 MHz
Line Related Tests	EN 61000-4.11 AC Power Supply Input: voltage drop: -30% for 10 ms, -60% for 100ms voltage interrupt: at voltage greater than -95% for 5 sec. voltage fluctuation: +10% for 15 minutes DC Power Supply Input voltage fluctuation: +20% for 15 minutes, -20% for 15 minutes

Controller Dimensions

Dimensions are in millimeters (inches).

Controller spacing = 50 mm (2 in) on all sides for adequate ventilation.

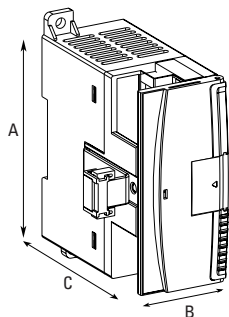## MicroLogix 1100 Controller Dimension Drawing

1763-L16AWA, 1763-L16BWA, 1763-L16BBB

MicroLogix 1100 Controller Dimensions

Dimension	1763-L16AWA, 1763-L16BWA, 1763-16BBB
A	90 mm (3.5 in)
B	110 mm (4.33 in)
C	87 mm (3.43 in)

1762 Expansion I/O Dimensions

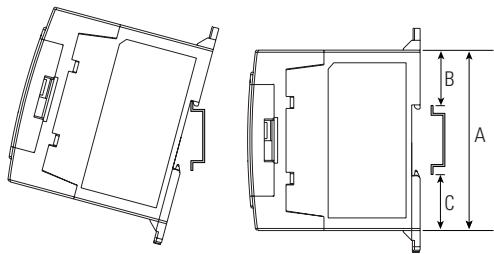| Dimension	Expansion I/O Module
A	90 mm (3.5 in)
B	40 mm (1.57 in)
C	87 mm (3.43 in)

Controller Spacing

The controller mounts horizontally, with the expansion I/O extending to the right of the controller. Allow 50 mm (2 in) of space on all but the right side for adequate ventilation, as shown below.

DIN Rail Mounting

The maximum extension of the latch is 14 mm (0.55 in) in the open position. A flat-blade screwdriver is required for removal of the controller. The controller can be mounted to EN50022-35 x 7.5 or EN50022-35 x 15 DIN rails. DIN rail mounting dimensions are shown below.

Dimension	Height
A	90 mm (3.5 in)
B	27.5 mm (1.08 in)
C	27.5 mm (1.08 in)

Select MicroLogix Communication Interface Devices

Step 2 - Select:

- *communication network - based on application requirements*
- *record your selection in the Selection Record (starts on Page 39)*

Communication Networks

MicroLogix controllers allow you to choose the network that best meets your needs.

- Channel 0 Isolated RS-232 / RS-485 Combo port
- For RS-232 communications:
    - 300; 600; 1200; 4800; 9600; 19.2K and 38.4K baud rates
    - RTS/CTS hardware handshake signals
    - Connection to DH-485, DeviceNet and Ethernet networks through the 1761-NET-AIC, 1761-NET-DNI and 1761-NET-ENI interface modules, respectively *(MicroLogix 1100 controllers also connect to DH-485 directly through 1763-NC01 cable to Channel 0 and to Ethernet networks directly through Channel 1. MicroLogix 1500 controllers also provide DeviceNet Master capability via the 1769-SDN DeviceNet Scanner Module)*
    - Connection to modems for remote communications
    - ASCII messaging provides dial-out capability
    - DF1 Half-Duplex Slave
    - DF1 Full-Duplex Master
    - Modbus RTU Master / Slave through the 1761-NET-AIC module *(MicroLogix 1100 controllers also connect to Modbus RTU Master / Slave directly through 1763-NC01 cable to Channel 0)*

Note: The MicroLogix 1100 controller does not provide 24V dc power for network interface whereas all other MicroLogix controllers do. The 24V dc comms power must be provided externally when 1761-NET-AIC or 1761-NET-ENI or 1761-NET-ENIW modules are used with a MicroLogix 1100 controller. MicroLogix 1100 controllers provide direct connection to RS-485 networks using the same pins used by the other MicroLogix controllers for 24V dc communication power.

MicroLogix Network Options
(RS-232 unless otherwise noted)

If your application requires:	Use this network:
• Connection to dial-up modems for remote program maintenance or data collection • Connection to leased-line or radio modems for use in SCADA systems • Remote Terminal Unit (RTU) functions • Program upload, download and monitoring	DF1 Full-Duplex DF1 Half-Duplex Slave DF1 Radio Modem
• Plant-wide and cell-level data sharing with program maintenance • Data sharing between 32 controllers • Peer-to-peer communication • Program upload, download and monitoring • Compatibility with multiple Allen-Bradley HMI devices	DH-485 directly through channel 0 RS-485 port using 1763-NC01 cable DH-485 via the 1761-NET-AIC Advanced Interface Converter or 1747-UIC USB to DH-485 Converter✶
• Data sharing between 64 devices • Better diagnostics for improved data collection and fault detection • Less wiring and reduced start-up time than traditional, hard-wired systems • Program upload, download and monitoring • Peer-to-peer communication	DeviceNet via the 1761-NET-DNI DeviceNet Interface
• Program upload, download and monitoring • Peer-to-peer communication • Email communication • 10/100Base-T port with embedded LEDS • Web server capability via the 1761-NET-ENIW	EtherNet/IP directly through Channel 1 10/100 Mbps communication port❈ EtherNet/IP via the 1761-NET-ENI Ethernet Interface or 1761-NET-ENIW Web enabled Ethernet Interface ✶
• Connection to third party devices for remote data collection in a SCADA system (i.e., telephone modems, radio modems, leased lines, etc.) • Remote Terminal Unit (RTU) functions	Modbus RTU Master / Slave directly through channel 0 RS-485 port using 1763-NC01 cable Modbus RTU Slave via the 1761-NET-AIC Advanced Interface Converter ✶ Modbus RTU Master via the 1761-NET-AIC Advanced Interface Converter ✶

✶ MicroLogix 1100 controllers do not provide 24V dc power for network interface devices. External 24V dc module power must be supplied.
❈ Direct EtherNet/IP connections through MicroLogix 1100 controllers provide web server capabilities but do not support email communications.

MicroLogix Network Interface Devices

The following information describes the functionality of the MicroLogix Interface Modules. For most applications, the embedded RS-485 and Ethernet / IP functionality of the MicroLogix 1100 communication ports replaces the 1761-NET-AIC, 1761-NET-ENI, and the 1761-NET-ENIW (or AIC+, ENI, and ENIW) modules.

The network interface devices can be mounted on a panel or DIN rail. See Network Interface Devices Communication Port Identification on page 24 for device drawings.

AIC+ Advanced Interface Converter (1761-NET-AIC)

The AIC+ is an isolated, RS-232 to RS-485 electrical signal converter for supporting serial, half-duplex, multi-drop protocols; such as:

• DH-485

• DF1 Half-Duplex Master/Slave

• Modbus RTU (a single master can communicate with a maximum of 247 slave devices)

Since RS-232 ports can only be connected point-to-point between two devices, an AIC+ (or similar device) is required whenever a MicroLogix controller is configured for one of these protocols *and* needs to communicate with more than one other device at a time. The AIC+ also provides electrical isolation between each of its three ports for a more stable network and protection for connected devices.

When using the 1763-NC01 cable, the MicroLogix 1100 provides isolated connection to RS-485 networks *directly* from the Channel 0 combo port.

Any MicroLogix controller can connect to either of the two RS-232 ports on the AIC+. When Channel 0 on a MicroLogix 1000, 1200, or 1500 controller is connected to Port 2 (RS-232 8-pin mini-DIN) of the AIC+, the Interface Module can draw its power from the MicroLogix controller. In all other cases, including utilizing MicroLogix 1100 controllers, the AIC+ must be powered from an external, 24V dc power supply. The AIC+ can also be used as an RS-232 to RS-485 converter and port isolator for any other Allen-Bradley controller or terminal with an RS-232 port.

Since the AIC+ is not a protocol converter, all devices connected to a single AIC+ (or a network of AIC+s) must be configured for the same communication protocol.

DH-485/RS-485 Network Specifications

Specification	1761-NET-AIC
Maximum Number of Nodes	32 per multi-drop network
Maximum Length	1219 m (4,000 ft) per multi-drop network

DNI DeviceNet Interface (1761-NET-DNI)

DNI capabilities:

• Peer-to-peer messaging between Allen-Bradley controllers and other devices using the DF1 Full-Duplex protocol

• Programming and online monitoring over the DeviceNet network

• With a DNI connected to a modem, you can dial in to any other DNI-controller combination on DeviceNet

• Other DeviceNet products can send explicit (Get or Set) messages with the DNI at any time

• The controller can initiate an explicit message to a UCMM (Unconnected Message Manager) compatible device on DeviceNet

DeviceNet Specifications

Specification	1761-NET-DNI
Maximum Number of Nodes	64
Maximum Length	500 m @ 125K baud or 100 m @ 500K baud
DeviceNet Agency Certification	ODVA conformance 2.0-A12

The following information describes the functionality of the MicroLogix Interface Converter Modules.

ENI Ethernet Interface (1761-NET-ENI) and ENIW Ethernet Interface with Web Server Capabilities (1761-NET-ENIW)

The ENI provides EtherNet/IP connectivity for all MicroLogix controllers and other DF1 Full-Duplex devices. The ENI allows you to easily connect a MicroLogix controller to a new or existing Ethernet network to update/download programs, communicate between controllers and generate email messages via SMTP (simple mail transport protocol).

The ENIW adds web server capabilities, enabling the display of four standard data web pages with user-configurable data descriptions and 10 user-configurable web page links on the ENIW home page.

MicroLogix 1100 controllers also provide EtherNet/IP connectivity and Web server capabilities directly through Channel 1 but do not support email communications (in the Phase 1 release).

Ethernet Specifications

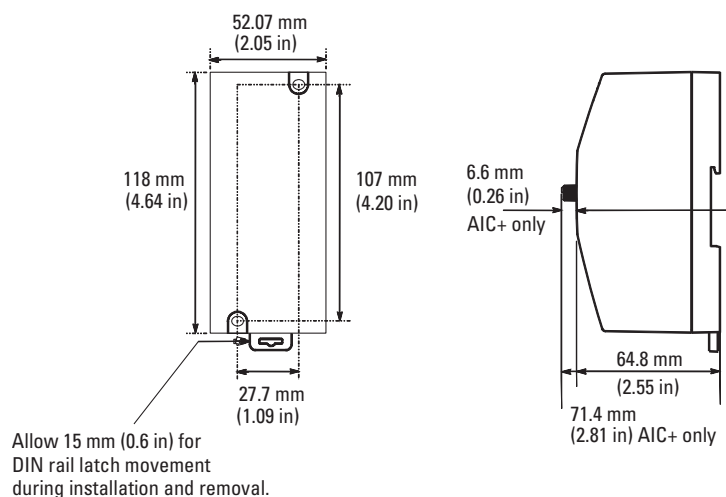| Specification	1761-NET-ENI
Communication Rate	10/100 MHz (Series C), 10 MHz (Series A and B)
Connector	100Base-T (Series C), 10Base-T (Series A and B)

AIC+, DNI and ENI/ENIW Specifications

Network Modules Specifications

Specifications	1761-NET-AIC	1761-NET-DNI	1761-NET-ENI, 1761-NET-ENIW
Power Supply DC Voltage Range ∗	20.4…28.8V dc	11…25V dc	20.4…26.4V dc
Current Draw (mA) at 24V dc	120 mA	200 mA	50 mA
Inrush Current, Max.	200 mA @ 24V	400 mA @ 24V	200 mA @ 24V
Isolation Voltage	500V dc for one minute	500V dc for 1 minute	710V dc for one minute
Operating Temperature	0…60 °C (32…140 °F)		
Storage Temperature	-40…85 °C (-40…185 °F)		
Relative Humidity	5…95% non-condensing		
Vibration	Operating: 10…500 Hz, 5.0 g, 0.030 in. peak-to-peak, 2 hour each axis	Operating: 5…2000 Hz, 2.5 g, 0.015 in. peak-to-peak, 1 hour each axis Non-operating: 5…2000 Hz, 5.0g, 0.030 in. peak-to-peak, 1 hour each axis	Operating: 10…500 Hz, 5.0 g, 0.030 in. peak-to-peak, 2 hour each axis
Shock, Operating	30 g, ±3 times each axis	30 g, ±3 times each axis	30 g, ±3 times each axis
Shock, Non-Operating	50 g, ±3 times each axis	50 g, ±3 times each axis	35 g (DIN rail mount) 50 g (panel mount) ±3 times each axis
Certifications	UL Listed Industrial Control Equipment for use in Class 1, Division 2, Hazardous Locations, Groups A, B, C, D.		
	c-UL Listed Industrial Control Equipment for use in Canada.		
	CE marked for all applicable directives.		
	C-Tick marked for applicable acts.		

∗ When the device is connected to a MicroLogix 1000, 1200, or 1500 controller, power is provided by the MicroLogix controller's communication port. Power is not supplied by the MicroLogix 1100 controllers. External 24V dc module power must be supplied.

AIC+, DNI and ENI/ENIW Dimensions

Network Interface Devices Dimensions

52.07 mm
(2.05 in)

118 mm
(4.64 in)

107 mm
(4.20 in)

6.6 mm
(0.26 in)
AIC+ only

27.7 mm
(1.09 in)

64.8 mm
(2.55 in)

71.4 mm
(2.81 in) AIC+ only

Allow 15 mm (0.6 in) for DIN rail latch movement during installation and removal.

Select Programming Software

Step 3 - Select:

- *software - the appropriate RSLogix 500 package for your application*

- *record your selection in the Selection Record (starts on page 39)*

Programming Software

The RSLogix 500 ladder logic programming package helps you maximize performance, save project development time and improve productivity. This product has been developed to operate on Windows® operating systems. RSLogix 500 can be used for programming both the SLC 500 and MicroLogix controller families.

RSLogix 500 Selection Chart

Cat. No.	Description
9324-RL0100ENE	RSLogix 500 Starter Edition Programming Software for MicroLogix controller families. (CD-ROM)
9324-RL0300ENE	RSLogix 500 Standard Edition Programming Software for SLC 500 and MicroLogix controller families. (CD-ROM)
9324-RL0700NXENE	RSLogix 500 Professional Edition. CD-ROM also includes RSLogix Emulate 500, RSNetWorx for DeviceNet and RSNetWorx for ControlNet.

Select Cables

Cables come in several lengths and connector styles to provide connectivity between MicroLogix controllers and other devices.

Step 4 - Select:

• *cables - review device port identification to find cable in the selection chart*

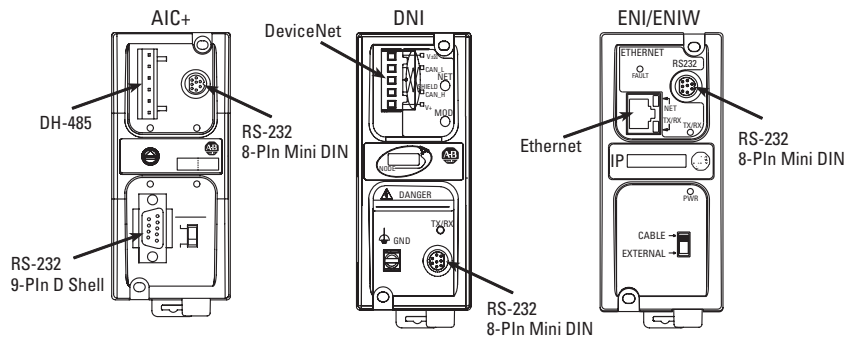• *record your selection in the Selection Record (starts on page 39)*

Network Cable Selection

Controller and PC Port Identification

Device	Communication Port Description	Connector Type
MicroLogix 1100	RS-232/RS-485 Communications Port (Channel 0, no 24V dc power for communication Interface Modules)	8-pin Mini DIN
	10/100Mbps EtherNet/IP Communications Port (Channel 1)	RJ-45
Personal Computer	Personal Computer Serial Communications Port	9-pin D Shell
	Personal Computer Ethernet Communications Port	RJ-45

Network Interface Devices Communication Port Identification

Network Cable Selection Chart

Connectors	Length	Cat. No.
8-pin Mini DIN to 8-pin Mini DIN	45 cm (17.7 in)	1761-CBL-AM00 (Series C or later for Class 1 Div 2 applications)
8-pin Mini DIN to 8-pin Mini DIN	2 m (6.5 ft)	1761-CBL-HM02 (Series C or later for Class 1 Div 2 applications)
8-pin Mini DIN to 9-pin D Shell	45 cm (17.7 in)	1761-CBL-AP00 (Series C or later for Class 1 Div 2 applications)
8-pin Mini DIN to 9-pin D Shell	2 m (6.5 ft)	1761-CBL-PM02 (Series C or later for Class 1 Div 2 applications)
8-pin Mini DIN to 8-pin Mini DIN	15 m (49.2 ft)	2707-NC9 (Series C or later for Class 1 Div 2 applications)
8-pin Mini DIN to 6-pin DH-485 terminal	30 cm (11.8 in)	1763-NC01 Series A
RJ-45 to RJ-45	100 m (328 ft) maximum	Ethernet Cable (commercially available)

Programming Cable Selection

Programming Cable Selection Chart - Programming Device to Controller

Programming Device	MicroLogix 1100 Channel 0 (8-pin Mini DIN)		MicroLogix 1100 Channel 1 (RJ-45)	
	Cat. No.	Length	Cat. No.	Length
Personal Computer (9-pin D Shell)	1761-CBL-PM02 (Series C or later for Class I Div 2 applications)	2 m (6.5 ft)	—	—
Personal Computer (RJ-45)	—	—	Ethernet Cable (Commercially available)	100 m (328 ft) maximum

1747-UIC Universal Serial Bus to DH-485 Interface Converter

This device allows a computer with a USB port to interface to DH-485 ports on an SLC 500, MicroLogix, or other Rockwell Automation controllers and on PanelView terminals. The 1747-UIC features a USB connector as well as both an RS-232 and an RS-485 port. Use the RS-232 port to connect to SLC 5/03, 5/04, 5/05 (Channel 0), MicroLogix, CompactLogix, FlexLogix, ControlLogix, PanelView 300 or higher, or AIC+. Use the RS-485 Port to connect to SLC 5/01, 5/02, 5/03 (Channel 1), PanelView 300 or higher, or 1747-AIC.

USB to DH-485 Interface Converter Specifications

Cat. No.	1747-UIC
USB Power Consumption	<100 mA (low power)
USB Speed	USB 1.1 (12 Mbps)
DH-485 Baud Rate	19.2K bps

Programming Cable Selection Chart - Programming Device to Controller via 1747-UIC

Programming Device	MicroLogix 1100 Channel 0 (8-pin Mini DIN) to PC via 1747-UIC Universal Serial Bus to DH-485 Interface Converter	
	Cat. No.	**Length**
Personal Computer (USB Port)	1761-CBL-PM02 Series C or later	2 m (6.5 ft)

Programming Cable Selection Chart - Programming Device to AIC+ (DH-485 only) via 1747-UIC

Programming Device	1761-NET-AIC (8-PIN Mini DIN) to PC via 1747-UIC Universal Serial Bus to DH-485 Interface Converter	
	Cat. No.	**Length**
Personal Computer (USB Port)	1763-NC01 Series A or later	30 cm (11.8 in)

Programming Cable Selection Chart - Programming Device to Controller via 9300-USBS

Programming Device	MicroLogix 1100 Channel 0 (8-pin Mini Din) to PC via 9300-USBS Universal Serial Bus to DF1 Interface Converter	
	Cat. No.	**Length**
Personal Computer (USB Port)	1761-CBL-PM02 Series C or later	2 m (6.5 ft)

Select MicroLogix 1100 Controllers

Step 5 - Select:

- *controller - review power and I/O configurations to select a controller catalog number; see power supply and I/O specifications for more detailed information*

- *accessories - memory modules*

- *record your selection in the Selection Record (starts on page 39)*
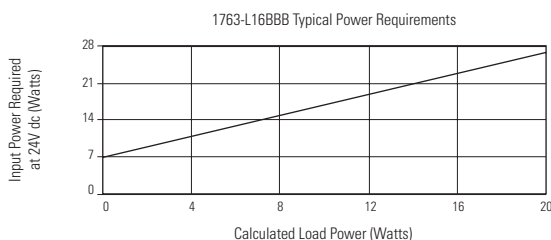
MicroLogix 1100 Specifications

MicroLogix 1100 Controller Power and I/O Configuration

Cat. No.	Line Voltage	Number of Inputs	Number of Outputs	High Speed I/O
1763-L16AWA	120/240V ac	(10) 120V ac (2) Analog Voltage	(6) Individually Isolated Relay	None
1763-L16BWA	120/240V ac	(6) 24V dc (4) Fast 24V dc (2) Analog Voltage	(6) Individually Isolated Relay	(4) 20 kHz Input
1763-L16BBB	24V dc	(6) 24V dc (4) Fast 24V dc (2) Analog Voltage	(2) Individually Isolated Relay (2) 24V dc FET (2) Fast 24V dc FET	(4) 20 kHz input (2) 20 kHz Output

MicroLogix 1100 Controller Power Supply Specifications

Specification	1763-L16AWA	1763-L16BWA	1763-L16BBB
Power Supply Voltage	85…264V ac @ 47…63 Hz		20.4…26.4V dc Class 2 SELV
Power Consumption	46 VA	52 VA	35 W
Power Supply Inrush Current (max.)	120V ac: 25 A for 8 ms 240V ac: 40 A for 4 ms		24V dc: 15 A for 20 ms
24V dc Sensor Power	—	200 mA, 400 µF capacitance max.	—

MicroLogix 1100 DC Input Power Requirements for 1763-L16BBB Unit

1763-L16BBB Typical Power Requirements

MicroLogix 1100 Controller Digital Input Specifications

Specification	1763-L16AWA	1763-L16BWA and 1763-L16BBB	
		Inputs 0 through 3	Inputs 4 and higher
On-State Voltage Range	79…132V ac @ 47…63 Hz	14…26.4V dc @ 65 °C (149 °F) 14…30.0V dc @ 30 °C (86 °F)	10…26.4V dc @ 65 °C (149 °F) 10…30.0V dc @ 30 °C (86 °F)
Off-State Voltage Range	0…20V ac	0…5V dc	
Operating Frequency	47…63 Hz	0 Hz…20 kHz	0 Hz…1 kHz
Signal Delay (max.)	On Delay = 20 ms Off Delay = 20 ms	standard inputs: selectable from 0.5…16 ms high-speed inputs: selectable from 0.025…16 ms	
On-State Current:			
Minimum Nominal Maximum	5.0 mA @ 79V ac 12 mA @ 120V ac 16.0 mA @ 132V ac	2.5 mA @ 14V dc 8.8 mA @ 24V dc 12.0 mA @ 30V dc	2.0 mA @ 10V dc 8.5 mA @ 24V dc 12.0 mA @ 30V dc
Off-State Leakage Current (max.)	2.5 mA max.	1.5 mA min.	
Nominal Impedance	12 kΩ @ 50 Hz 10 kΩ @ 60 Hz	3.1 kΩ	
Maximum Inrush Current	250 mA @ 120V ac	—	

MicroLogix 1100 Controller Digital Output Specifications

Specification	1763-L16AWA and 1763-L16BWA	1763-L16BBB	
	Relay	FET Standard Operation	FET High-Speed Operation (Output 2 only)
Operating Voltage Range	5…125V dc 5…264V ac	20.4…26.4V dc	
Continuous Current per Point (max.)∗	See MicroLogix 1100 Relay Contact Rating	See MicroLogix 1100 FET Standard Outputs Continuous Current per Point (max.)	100 mA
Continuous Current per Common (max.).	5 A / 3 A		
Continuous Current per Controller (max.).	30 A or total of per-point loads, whichever is less at 150V max. 20 A or total of per-point loads, whichever is less at 240V max.		
On-State Current (min.)	10.0 mA	1 mA	10.0 mA
Off-State Leakage Current (max.)	0 mA	1 mA	
Signal Delay (max.) - resistive load	On Delay = 10 ms Off Delay = 10 ms	On Delay = 0.1 ms Off Delay = 1.0 ms	On Delay = 6 µs Off Delay = 18 µs
Surge Current per Point (peak)	—	4 A for 10 ms ❋	—

∗ 5 A for UL 508
3 A for UL 1604, Class 1, Division 2, Hazardous Locations, Groups A, B, C, D
❋ Repeatability is once every 2 seconds at 65 °C (149 °F), once every 1 second at 30 °C (86 °F).

MicroLogix 1100 Controller Analog Input Specifications

Specification	1763-L16AWA, 1763-L16BWA, 1763-L16BBB
Voltage Input Range	0…+10V dc
Input Coding (0…10V dc)	0…+1023
Voltage Impedance	210 kΩ
Input Resolution	10 bit
Non-linearity (in percent full scale)	±0.5%
Overall Accuracy	±0.5% full scale at -20…+65 °C (-4…+149 °F)
Update Time	100 ms
Voltage Input Overvoltage Protection	10.5V dc
Field Wiring to Logic Isolation	Non-isolated with logic

MicroLogix 1100 Relay Contact Rating

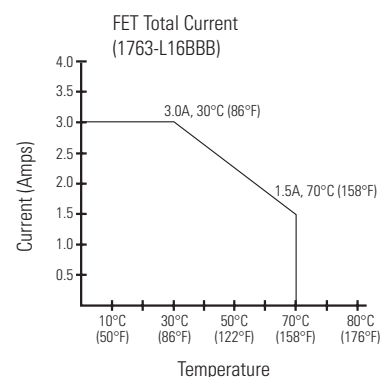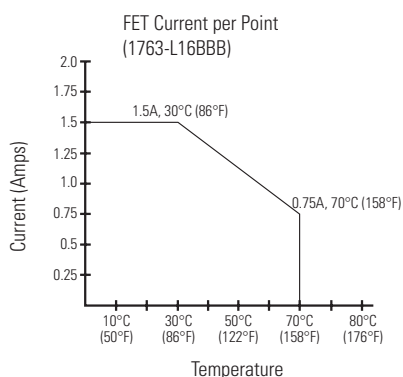| Maximum Voltage	Amperes		Amperes Continuous ‡	Voltamperes	
	Make	Break		Make	Break
240V ac	15.0 A	1.5 A	5.0 A / 3.0 A ✳	3600 VA	360 VA
120V ac	30 A	3.0 A			
125V dc	.22 A ✶		1.0 A	28 VA	
24V dc	1.2 A ✶				

✶ For dc voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28 VA by the applied dc voltage. For example, 28 VA/48V dc = 0.58 A. For dc voltage applications less than 14V, the make/break ratings for relay contacts cannot exceed 2 A.
✳ 5.0 A for UL 508
3.0 A for UL 1604, Class 1, Division 2, Hazardous Locations, Group A, B, C, D
‡ 3.0 A above 40° C

MicroLogix 1100 FET Standard Outputs Continuous Current per Point (max.)

FET Current per Point
(1763-L16BBB)

1.5A, 30°C (86°F)

0.75A, 70°C (158°F)

Current (Amps)

Temperature

FET Total Current
(1763-L16BBB)

3.0A, 30°C (86°F)

1.5A, 70°C (158°F)

Current (Amps)

Temperature

MicroLogix 1100 Memory Module

The controller is shipped with a memory module port cover in place. You can order the memory module to provide removable backup of your User Program and User Data, or to transport your program between controllers.

Memory Module (1763-MM1)

Memory modules allow:

• user programs and data to be stored as backup

• transport programs for use with other controllers

• special safety/security features for press control and other critical applications

• auto-recovery, through a power cycle, after a controller fault

• comparison of programs

• data file and memory module write protection

• removal/insertion under power

Select MicroLogix 1100 Expansion I/O

Step 6 - Select:

- *I/O modules - digital, analog and temperature*

- *record your selections in the Selection Record (starts on page 39)*

MicroLogix 1100 controllers expand using the same 1762 I/O platform as MicroLogix 1200 controllers. The 1762 I/O expansion modules provide superior functionality in a small sized low-cost package. A variety of modules complement and extend the capabilities of MicroLogix 1100 controllers by maximizing the flexibility of I/O count and type.

The MicroLogix 1100 system design allows modules to be either DIN-rail or panel mounted. The DIN latches and screw mounting holes are an integral part of the package design.

Controller I/O can be expanded using up to four 1762 I/O modules.

Advantages

- Rackless design, eliminating added system costs and inventory
- Small footprint with high density I/O, minimizing panel space requirements
- Integral high-performance I/O bus
- Software keying to prevent incorrect positioning within the system
- Feature-rich I/O functionality addresses a wide range of applications
- AC/DC relay, 24V dc, 120V ac and 240V ac voltages
- Thermocouple/mV and RTD/Resistance temperature input modules

Available Modules

1762 Expansion I/O Modules

Cat. No.	Description
Digital:	
1762-IA8	8-Point 120V ac Input Module
1762-IQ8	8-Point Sink/Source 24V dc Input Module
1762-IQ16	16-Point Sink/Source 24V dc Input Module
1762-OA8	8-Point 120/240V ac Triac Output Module
1762-OB8	8-Point Sourcing 24V dc Output Module
1762-OB16	16-Point Sourcing 24V dc Output Module
1762-OW8	8-Point AC/DC Relay Output Module
1762-OW16	16-Point AC/DC Relay Output Module
1762-OX6I	6-Point Isolated AC/DC Relay Output Module
Analog:	
1762-IF4	4-Channel Voltage/Current Analog Input Module
1762-OF4	4-Channel Voltage/Current Analog Output Module
1762-IF2OF2	Combination 2-Channel Input 2-Channel Output Voltage/Current Analog Module
Specialty:	
1762-IR4	4-Channel RTD/Resistance Input Module
1762-IT4	4-Channel Thermocouple/mV Input Module

1762 Digital I/O

1762 Digital Expansion Input Modules Specifications

Specification	1762-IA8	1762-IQ8	1762-IQ16
Voltage Category	100/120V ac	24V dc (sink/source) ✶	24V dc (sink/source) ✶
Operating Voltage Range	79…132V ac @ 47…63 Hz	10…26.4V dc @ 55 °C (131 °F) 10…30V dc @ 30 °C (86 °F)	10…26.4V dc @ 55 °C (131 °F) 10…30V dc @ 30 °C (86 °F)
Number of Inputs	8	8	16
Number of Commons	1	1	2
Bus Current Draw (max.)	50 mA @ 5V dc (0.25 W)	50 mA @ 5V dc (0.25 W)	60 mA @ 5V dc (0.25 W)
Heat Dissipation (max.)	2.0 Total Watts	3.7 Total Watts	5.3 Total Watts @ 30V 4.2 Total Watts @ 26.4V
Signal Delay (max.)	On Delay: 20.0 ms Off Delay: 20.0 ms	On Delay: 8.0 ms Off Delay: 8.0 ms	On Delay: 8.0 ms Off Delay: 8.0 ms
Off-State Voltage (max.)	20V ac	5V dc	5V dc
Off-State Leakage Current (max.)	2.5 mA	1.5 mA	1.5 mA
On-State Voltage (min.)	79V ac (min.) 132V ac (max.)	10V dc	10V dc
On-State Current:			
minimum nominal maximum	5.0 mA @ 79V ac @ 47 Hz 12.0 mA @ 120V ac @ 60 Hz 16.0 mA @ 132V ac @ 63 Hz	2.0 mA @ 10V dc 8.0 mA @ 24V dc 12.0 mA @ 30V dc	2.0 mA @ 10V dc 8.0 mA @ 24V dc 12.0 mA @ 30V dc
Inrush Current (max.)	250 mA	—	—
Nominal Impedance	12 kΩ @ 50 Hz 10 kΩ @ 60 Hz	3 kΩ	3 kΩ
Isolated Groups	Group 1: inputs 0…7 (internally connected commons)	Group 1: inputs 0…7 (internally connected commons)	Group 1: inputs 0…7 Group 2: inputs 8…15
Input Group to Backplane Isolation	Verified by one of the following dielectric tests: 1517V ac for 1 s or 2145V dc for 1 s 132V ac working voltage (IEC Class 2 reinforced insulation)	Verified by one of the following dielectric tests: 1200V ac for 1 s or 1697V dc for 1 s 75V dc working voltage (IEC Class 2 reinforced insulation)	

✶ Sinking/Sourcing Inputs - Sourcing/sinking describes the current flow between the I/O module and the field device. Sourcing I/O circuits supply (source) current to sinking field devices. Sinking I/O circuits are driven by a current sourcing field device. Field devices connected to the negative side (DC Common) of the field power supply are sinking field devices. Field devices connected to the positive side (+V) of the field supply are sourcing field devices.

1762 Digital Expansion Output Modules Specifications

Specification	1762-OA8	1762-OB8	1762-OB16	1762-OW8	1762-OW16	1762-OX6I
Voltage Category	100/120V ac	24V dc	24V dc	AC/DC normally open relay	AC/DC normally open relay	AC/DC Type C Relay
Operating Voltage Range	85…265V ac @ 47…63 Hz	20…26.4V dc	20…26.4V dc	5…265V ac 5…125V dc	5…265V ac 5…125V dc	5…265V ac 5…125V dc
Number of Outputs	8	8	16	8	16	6 (N.C., N.O.)
Number of Commons	2	1	1	2	2	6
Bus Current Draw (max.)	115 mA @ 5V dc (0.575 W)	115 mA @ 5V dc (0.575 W)	175 mA @ 5V dc (0.88 W)	80 mA @ 5V dc (0.40 W) 90 mA @ 24V dc (2.16 W)	120 mA @ 5V dc (0.60 W) 140 mA @ 24V dc (3.36 W)	110 mA @ 5V dc (0.55 W) 110 mA @ 24V dc (2.64 W)
Heat Dissipation (max.)	2.9 Total Watts	1.61 Total Watts	2.9 Total Watts @ 30 °C (86 °F) 2.1 Total Watts @ 55 °C (131 °F)	2.9 Total Watts	5.6 Total Watts	2.8 Total Watts
Signal Delay (max.) - resistive load	On Delay: 1/2 cycle Off Delay: 1/2 cycle	On Delay: 0.1 ms Off Delay: 1.0 ms	On Delay: 0.1 ms Off Delay: 1.0 ms	On Delay: 10 ms Off Delay: 10 ms	On Delay: 10 ms Off Delay: 10 ms	On Delay: 10 ms Off Delay: 20 ms
Off-State Leakage Current (max.)	2 mA @ 132V 2.5 mA at 265V	1.0 mA	1.0 mA	0 mA	0 mA	0 mA
On-State Current (min.)	10 mA	1.0 mA	1.0 mA	10 mA @ 5V dc	10 mA	100 mA
On-State Voltage Drop (min.)	1.5V @ 0.5A	1.0V dc	1.0V dc	—	—	—
Continuous Current per Point (max.)	0.25 A @ 55 °C (131 °F) 0.5 A @ 30 °C (86 °F)	0.5 A @ 55 °C (131 °F) 1.0 A @ 30 °C (86 °F)	0.5 A @ 55 °C (131 °F) 1.0 A @ 30 °C (86 °F)	2.5 A (Also see 1761-SG001 (MicroLogix Programmable Controllers Family Selection Guide), MicroLogix 1200 Relay Contact Rating on Page 31.)		7 A (Also see 1761-SG001 (MicroLogix Programmable Controllers Family Selection Guide), MicroLogix 1200 Relay Contact Rating on Page 31.)
Continuous Current per Common (max.)	1.0 A @ 55 °C (131 °F) 2.0 A @ 30 °C (86 °F)	4.0 A @ 55 °C (131 °F) 8.0 A @ 30 °C (86 °F)	4.0 A @ 55 °C (131 °F) 8.0 A @ 30 °C (86 °F)	8 A	8 A	7 A (Also see 1761-SG001 (MicroLogix Programmable Controllers Family Selection Guide), MicroLogix 1200 Relay Contact Rating on Page 31.)
Continuous Current per Module (max.)	2.0 A @ 55 °C (131 °F) 4.0 A @ 30 °C (86 °F)	4.0 A @ 55 °C (131 °F) 8.0 A @ 30 °C (86 °F)	4.0 A @ 55 °C (131 °F) 8.0 A @ 30 °C (86 °F)	16 A	16 A	30 A
Surge Current (max.)	5.0 A ✶	2.0 A ❄	2.0 A ❄	See 1761-SG001 (MicroLogix Programmable Controllers Family Selection Guide), MicroLogix 1200 Relay Contact Rating on Page 31.		

✶ Repeatability is once every 2 seconds for a duration of 25 ms.
❄ Repeatability is once every 2 seconds @ 55 °C (131 °F), once every second @ 30 °C (86 °F) for a duration of 10 ms.

1762 Analog Modules

1762 Analog Expansion Modules Common Specifications

Specification	1762-IF4	1762-IF2OF2	1762-OF4
Bus Current Draw (max.)	40 mA @ 5V dc 50 mA @ 24V dc	40 mA @ 5V dc 105 mA @ 24V dc	40 mA @ 5V dc 165 mA @ 24V dc
Analog Normal Operating Ranges	Voltage: -10…+10V dc Current: 4…20 mA	Voltage: 0…10V dc Current: 4…20 mA	Voltage: 0…10V dc Current: 4…20 mA
Full Scale ✱ Analog Ranges	Voltage: -10.5…+10.5V dc Current: -21…+21 mA	Voltage: 0…10.5V dc Current: 0…21 mA	Voltage: 0…10.5V dc Current: 0…21 mA
Resolution	15 bits	12 bits (unipolar)	12 bits (unipolar)
Repeatability ❅	±0.1%	±0.1%	±0.1%
Input and Output Group to System Isolation	30V ac/30V dc rated working voltage ‡ (N.E.C. Class 2 required) (IEC Class 2 reinforced insulation) type test: 500V ac or 707V dc for 1 minute		30V ac/30V dc rated working voltage (IEC Class 2 reinforced insulation) type test: 500V ac or 707V dc for 1 minute

✱ The over- or under-range flag is set when the normal operating range is exceeded. The module continues to convert the analog input up to the maximum full scale range.
❅ Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
‡ Rated working voltage is the maximum continuous voltage that can be applied at the terminals with respect to earth ground.

1762 Analog Expansion Input Modules Specifications

Specification	1762-IF4	1762-IF2OF2
Number of Inputs	4 differential (bipolar)	2 differential (unipolar)
Update Time (typical)	130, 250, 290, 450, 530 ms (selectable)	2.5 ms
A/D Converter Type	Successive approximation	Successive approximation
Common Mode Voltage Range §	±27V	±27V
Common Mode Rejection ♣	> 55 dB @ 50 and 60 Hz	> 55 dB @ 50 and 60 Hz
Non-linearity (in percent full scale)	±0.1%	±0.1%
Typical Overall Accuracy ➤	±0.3% full scale at 0…55 °C (32…131 °F) ±0.24% full scale at 25 °C (77 °F)	±0.5% full scale at 0…55 °C (32…131 °F) ±0.3% full scale at 25 °C (77 °F)
Input Impedance	Voltage Terminal: 200 kΩ Current Terminal: 275 Ω	Voltage Terminal: 200 kΩ Current Terminal: 250 Ω
Current Input Protection	±32 mA	±32 mA
Voltage Input Protection	±30V	±30V
Channel Diagnostics	Over or under range or open circuit condition by bit reporting for analog inputs.	

§ For proper operation, both the plus and minus input terminals must be within ±27V of analog common.
♣ $V_{cm} = 1 V_{pk-pk} AC$
➤ $V_{cm} = 0$ (includes offset, gain, non-linearity and repeatability error terms)

1762 Analog Expansion Output Modules Specifications

Specification	1762-IF2OF2	1762-OF4
Number of Outputs	2 single-ended (unipolar)	4 single-ended (bipolar)
Update Time (typical)	4.5 ms	2.5 ms
D/A Converter Type	Resistor string	R-2R Ladder voltage switching
Resistive Load on Current Output	0…500 Ω (includes wire resistance)	0…500 Ω (includes wire resistance)
Load Range on Voltage Output	> 1 kΩ	> 1 kΩ
Reactive Load, Current Output	< 1 mH	< 1 mH
Reactive Load, Voltage Output	< 1 µF	< 1 µF
Typical Overall Accuracy ✴	±1% full scale @ 0…55 °C (32…131 °F) ±0.5% full scale @ 25 °C (77 °F)	±1% full scale @ 0…55 °C (32…131 °F) ±0.5% full scale @ 25 °C (77 °F)
Output Ripple, range 0…500 Hz (referred to output range)	< ±0.1%	< ±0.1%
Non-linearity (in percent full scale)	< ±0.5%	< ±0.5%
Open and Short-Circuit Protection	Continuous	Continuous
Open Protection	±32 mA	±32 mA

✴ Includes offset, gain, non-linearity and repeatability error terms.

1762 Temperature Input Modules

Use these modules as a cost-effective means of addressing process applications that require temperature measurement and control. Each channel can be individually configured using RSLogix 500 programming software. On-screen configuration allows you to choose the input type, filtering frequency, data format and status data. On-board scaling is also provided.

1762 Temperature Expansion Input Modules Specifications

Specification	1762-IT4	1762-IR4
Bus Current Draw (max.)	40 mA @ 5V dc 50 mA @ 24V dc	40 mA @ 5V dc 50 mA @ 24V dc
Number of Channels	4 input channels plus a CJC sensor	4 input channels
Accepted Inputs	Thermocouples Types: J, K, T, E, R, S, B, N, C Millivolt Input Ranges: ±50 mV and ±100 mV	RTDs: Platinum (385 and 3916), Copper (426), Nickel (672 and 618), Nickel-Iron (518) Resistance Ranges: 0…3000 Ω
Filter Frequency	10 Hz…1 kHz	10 Hz…1 kHz
Temperature Units	°C or °F	°C or °F
Data Formats	Raw/Proportional, Engineering Units, Engineering Units x 10, Scaled-for-PID, Percent Range	
Accuracy @ 25 °C (77 °F)	Thermocouple Inputs: ±0.5…±3.0 °C (±0.9…±5.4 °F) depending on thermocouple type Millivolt Inputs: ±15…±20 mV	With Autocalibration enabled… RTD Inputs: ±0.2…±0.6 °C (±0.36…±1.08 °F) depending on RTD type Resistance Inputs: ±0.5…±1.5 Ω depending on resistance value
Accuracy @ 0…55 °C (32…131 °F)	±0.8…±10 °C (±1.5…±18 °F) depending on thermocouple type Millivolt Inputs: ±25…±30 mV	With Autocalibration enabled… RTD Inputs: ±0.4…±1.1 °C (±0.72…±1.98 °F) depending on RTD type Resistance Inputs: ±0.25…±2.5 Ω depending on resistance value
Channel Update Time (typical)	7…303 ms per enabled channel + CJC update time, depending on filter selection (CJC update time is equal to the largest enabled channel's update time.)	6…303 ms per enabled channel, depending on filter selection
Channel Diagnostics	Over- or under-range and open circuit by bit reporting	Over or under range and open circuit by bit reporting
Calibration	The module performs autocalibration on channel enable and on a configuration change between channels. You can also program the module to calibrate every five minutes.	
Common Mode Noise Rejection	115 dB minimum @ 50 Hz (with 10 Hz or 50 Hz filter) 115 dB minimum @ 60 Hz (with 10 Hz or 60 Hz filter)	110 dB minimum @ 50 Hz (with 10 or 50 Hz filter) 110 dB minimum @ 60 Hz (with 10 or 60 Hz filter)
Normal Mode Noise Rejection	85 dB minimum @ 50 Hz (with 10 Hz or 50 Hz filter) 85 dB minimum @ 60 Hz (with 10 Hz or 60 Hz filter)	70 dB minimum @ 50 Hz (with 10 or 50 Hz filter) 70 dB minimum @ 60 Hz (with 10 or 60 Hz filter)
Input Group to System Isolation	720V dc for 1 minute	707V dc for 1 minute
Channel-to-Channel Isolation	±10V dc	±10V dc
Repeatability ✱	Thermocouples @ 25 °C (77 °F) and 10 Hz filter selected: ±0.1…±2.0 °C (±0.18…±3.6 °F) depending on thermocouple type Millivolt Inputs: ±6 μV	±0.1 °C (±0.18 °F) for Nickel and Nickel-Iron ±0.2 °C (±0.36 °F) for other RTD inputs ±0.04 Ω for 150 Ω resistances ±0.2 Ω for other resistances
Input Impedance	> 10 MΩ	> 10 MΩ

✱ Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.

Fill in Your Selection Listing

Step 7 - Select:

• *all catalog numbers required for your system specification*

Selection Record

Cat. No.	Description	Quantity Selected
MicroLogix 1100 Controllers and Accessories		
1763-L16AWA	MicroLogix 1100 16-Point AC Controller	
1763-L16BWA	MicroLogix 1100 16-Point AC Controller	
1763-L16BBB	MicroLogix 1100 16-Point DC Controller	
MicroLogix 1100 I/O		
1762-IA8	8-Point 120V ac Input Module	
1762-IF2OF2	Combination 2-Channel Input 2-Channel Output Voltage/Current Analog Module	
1762-IF4	4-Channel Voltage/Current Analog Input Module	
1762-IQ16	16-Point Sink/Source 24V dc Input Module	
1762-IQ8	8-Point Sink/Source 24V dc Input Module	
1762-IR4	4-Channel RTD/Resistance Input Module	
1762-IT4	4-Channel Thermocouple/mV Input Module	
1762-OA8	8-Point 120/240V ac Triac Output Module	
1762-OB16	16-Point Sourcing 24V dc Output Module	
1762-OB8	8-Point Sourcing 24V dc Output Module	
1762-OF4	4-Channel Voltage/Current Analog Output Module	
1762-OW16	16-Point AC/DC Relay Output Module	
1762-OW8	8-Point AC/DC Relay Output Module	
1762-OX6I	6-Point Isolated AC/DC Relay Output Module	
MicroLogix Communication and Interface Devices		
1761-NET-AIC	MicroLogix Advanced Interface Converter Module	
1761-NET-DNI	MicroLogix DeviceNet Interface Module	
1761-NET-ENI	MicroLogix EtherNet/IP Interface Module	
1761-NET-ENIW	MicroLogix EtherNet/IP Interface Module with Web Server Functionality	
Programming Software		
9324-RL0100ENE	RSLogix 500 Starter	
9324-RL0300ENE	RSLogix 500 Programming for the SLC 500 and MicroLogix Families	
9324-RL0700NXENE	RSLogix 500 Professional	
Cables		
1747-UIC	Universal Serial Bus (USB) to DH-485 Interface Converter	
9300-USBS	Universal Serial Bus to DF1 Interface Converter	
1761-CBL-AC00	RS-232 Operating Cable, 9-Pin D Shell to 9-Pin D Shell (MicroLogix), 0.5 m (1.5 ft)	
1761-CBL-AM00	RS-232 Operating Cable, 8-Pin Mini DIN to 8-Pin Mini DIN (MicroLogix), 0.5 m (1.5 ft)	
1761-CBL-AP00 (Series C or later for Class I Div 2 applications)	RS-232 Operating Cable, 8-Pin Mini DIN to 9-Pin D Shell (MicroLogix), 45 CM (17.7 in)	
1761-CBL-HM02 (Series C or later for Class I Div 2 applications)	RS-232 Operating/Programming Cable, 8-Pin Mini DIN to 8-Pin Mini DIN (MicroLogix), 2 M (6.5 ft)	
1761-CBL-PM02 (Series C or later for Class I Div 2 applications)	RS-232 Operating/Programming Cable, 8-Pin Mini DIN to 9-Pin D Shell (MicroLogix), 2 M (6.5 ft)	
2707-NC9 (Series C or later for Class I Div 2 applications)	RS-232 Operating/Programming Cable, 8-Pin Mini DIN to 8-Pin Mini DIN, 15 M (49.2 ft)	
1763-NC01	DH-485, 8-Pin Mini DIN to 6-Pin DH-485 connector (MicroLogix), 30 cm (11.8 in)	

Fill in Your Selection Listing

Step 7 - Select:

• *all catalog numbers required for your system specification*

Selection Record

Cat. No.	Description	Quantity Selected
MicroLogix 1100 Controllers and Accessories		
1763-L16AWA	MicroLogix 1100 16-Point AC Controller	
1763-L16BWA	MicroLogix 1100 16-Point AC Controller	
1763-L16BBB	MicroLogix 1100 16-Point DC Controller	
MicroLogix 1100 I/O		
1762-IA8	8-Point 120V ac Input Module	
1762-IF2OF2	Combination 2-Channel Input 2-Channel Output Voltage/Current Analog Module	
1762-IF4	4-Channel Voltage/Current Analog Input Module	
1762-IQ16	16-Point Sink/Source 24V dc Input Module	
1762-IQ8	8-Point Sink/Source 24V dc Input Module	
1762-IR4	4-Channel RTD/Resistance Input Module	
1762-IT4	4-Channel Thermocouple/mV Input Module	
1762-OA8	8-Point 120/240V ac Triac Output Module	
1762-OB16	16-Point Sourcing 24V dc Output Module	
1762-OB8	8-Point Sourcing 24V dc Output Module	
1762-OF4	4-Channel Voltage/Current Analog Output Module	
1762-OW16	16-Point AC/DC Relay Output Module	
1762-OW8	8-Point AC/DC Relay Output Module	
1762-OX6I	6-Point Isolated AC/DC Relay Output Module	
MicroLogix Communication and Interface Devices		
1761-NET-AIC	MicroLogix Advanced Interface Converter Module	
1761-NET-DNI	MicroLogix DeviceNet Interface Module	
1761-NET-ENI	MicroLogix EtherNet/IP Interface Module	
1761-NET-ENIW	MicroLogix EtherNet/IP Interface Module with Web Server Functionality	
Programming Software		
9324-RL0100ENE	RSLogix 500 Starter	
9324-RL0300ENE	RSLogix 500 Programming for the SLC 500 and MicroLogix Families	
9324-RL0700NXENE	RSLogix 500 Professional	
Cables		
1747-UIC	Universal Serial Bus (USB) to DH-485 Interface Converter	
9300-USBS	Universal Serial Bus to DF1 Interface Converter	
1761-CBL-AC00	RS-232 Operating Cable, 9-Pin D Shell to 9-Pin D Shell (MicroLogix), 0.5 m (1.5 ft)	
1761-CBL-AM00	RS-232 Operating Cable, 8-Pin Mini DIN to 8-Pin Mini DIN (MicroLogix), 0.5 m (1.5 ft)	
1761-CBL-AP00 (Series C or later for Class I Div 2 applications)	RS-232 Operating Cable, 8-Pin Mini DIN to 9-Pin D Shell (MicroLogix), 45 CM (17.7 in)	
1761-CBL-HM02 (Series C or later for Class I Div 2 applications)	RS-232 Operating/Programming Cable, 8-Pin Mini DIN to 8-Pin Mini DIN (MicroLogix), 2 M (6.5 ft)	
1761-CBL-PM02 (Series C or later for Class I Div 2 applications)	RS-232 Operating/Programming Cable, 8-Pin Mini DIN to 9-Pin D Shell (MicroLogix), 2 M (6.5 ft)	
2707-NC9 (Series C or later for Class I Div 2 applications	RS-232 Operating/Programming Cable, 8-Pin Mini DIN to 8-Pin Mini DIN, 15 M (49.2 ft)	
1763-NC01	DH-485, 8-Pin Mini DIN to 6-Pin DH-485 connector (MicroLogix), 30 cm (11.8 in)	

Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using our products. At http://support.rockwellautomation.com, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect Support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://support.rockwellautomation.com.

Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that is contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running.

United States	1.440.646.3223 Monday - Friday, 8am - 5 pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

New Product Satisfaction Return

We test all of our products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned:

United States	Contact your distributor. You must provide a Customer Support case number (see phone number above to obtain one) to your distributor in order to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for return procedure.

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